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TIMING FOR EXTENDED TARGET SIMULATION, (U)
JAN 78 R L MITCHELL
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TIMING FOR EXTENDED TARGET SIMULATION

✓ TECH NOTE 105-033

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TIMING FOR EXTENDED TARGET SIMULATION

R. L. Mitchell

MRI Report 149-6 ✓

4 January 1978

Several timing runs were conducted on the CDC Cyber 73 system for the baseline extended target simulation program. The results for FORTRAN are *

Geometry Update	ETGEO: .42 + .19N (msec)	(CDC)
Glint & Doppler Modulation	ETGDM: .75 + .61N (msec)	(CDC)

where N is the number of visible scatterers. The library routines of ATAN2, SQRT, SIN, and COS were replaced by dummy routines so the above times would be representative of the use of fast table lookup algorithms for these functions.

The timing is dominated by the Doppler update in ETGDM, the subroutine that should also be called more frequently than ETGEO. For a 20 msec update on TARGEO and a 10 msec update on ETGDM, we can accommodate about 12 scatterers, as

ETGEO:	1.35 msec/10 msec
ETGDM:	8.07 msec/10 msec
both :	9.42 msec/10 msec

If both subroutines are implemented on the Datacraft/6, one can anticipate about a factor of 3 slower performance. Thus about 4 scatterers can be accommodated.)

The glint and Doppler modulation (ETGDM) is best done on the AP120B. Assuming a conservative factor of 20 faster performance for this processor, we now have

* These subroutines formerly were named TARGEO and TARGDM, respectively.

ETGEO: $1.26 + .57N$ (msec) (Datacraft)
 ETGDM: $.038 + .03N$ (msec) (AP120B)

The limiting factor is now ETGEO, but we do not have to update this sub-routine very frequently. Assuming a 25 msec update on ETGEO and a 5 msec update on ETGDM, which is likely to be a realistic situation, we can now accommodate about 40 scatterers as

ETGEO: 24.1 msec/25 msec
 ETGDM: 1.2 msec/ 5 msec

The last loop in ETGEO (DO-20) could also be implemented on the AP120B. For this situation we have

ETGEO: $.42 + .01N$ (msec) (Datacraft/AP120B)
 ETGDM: $.038 + .03N$ (msec) (AP120B)

Assuming the same 5 msec update on ETGEO and ETGDM, we could accommodate 150 scatterers as

ETGEO: 1.9 msec/5 msec
 ETGDM: 4.5 msec/5 msec

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